Fostering Sustainable Coastal Development in the CNMI:

Decision Support Tools for Enhanced Management of Shoreline Properties

A proposal for the 2015-2017 NOAA Coastal Management Fellowship

Submitted By:
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BACKGROUND AND INTRODUCTION

Introduction to the Division of Coastal Resources Management

The Division of Coastal Resources Management (DCRM) was established in 1983 as the approved coastal zone management program in the Commonwealth of the Northern Marianas Islands (CNMI). Public Law tasks DCRM with implementing all aspects of NOAA's CZM program, and gives DCRM jurisdiction over the coastal zone, which covers all land mass in the Northern Mariana Islands. The office is divided into several sections, including coastal planning, marine monitoring, water quality, permitting, and enforcement. While DCRM's mission requires that these components function as a cohesive team, each section is regularly engaged in projects that may not directly involve the other sections. In order for DCRM to effectively manage the CNMI's coastal resources, it is essential that the results of this diverse work be integrated into the overall program. A primary mechanism for achieving this synergy is through the permitting process, which provides a means of filtering all current and future development in the Northern Mariana Islands through the lens of a comprehensive review.

With the recent completion of several large projects relevant to permitting concerns, and a two year long data collection initiative related to coastal hazards and vulnerabilities, DCRM is currently poised to begin a broad integration of project data that will provide significant insight into the suitability of various coastal properties for development or protection. DCRM proposes a NOAA Coastal Fellowship for 2015-2017 to develop a decision support tool that will accomplish (1) the integration of property-specific data related to a wide range of DCRM management priorities, (2) open access to this information for both DCRM permitting and coastal land owners, and (3) the ability to characterize coastal and shoreline property based on DCRM management priorities.

Impending Coastal and Shoreline Development in the CNMI

Efficient and forward-thinking decisions with regard to sustainable and resilient development are an imperative for the CNMI in the next five years. Recent activity among foreign investors and the CNMI Government have created potential future scenarios in which a large percentage of undeveloped coastal properties will be converted to large scale business ventures, primarily in the form of tourist resorts on Saipan. Specific properties with some of the Island's last remaining stretches of undeveloped shoreline have already entered into discussions among private and public interests. This development would support the CNMI's primary economic driver, and is therefore looked upon favorably by some of the community.

However, the forthcoming development proposals will also challenge the balance of natural, cultural, and economic resources throughout the Commonwealth. DCRM is in a position to not only ensure that this balance is maintained, but to support other government agencies, private interests, and public stakeholders in accessing and utilizing the best available information in decisions regarding development. The most significant information and data that DCRM will be utilizing relates to its regulatory focus areas and coastal resource planning projects.

DCRM Areas of Particular Concern

DCRM's regulatory actions are concentrated in five Areas of Particular Concern (APCs). The APCs are:

- **Shorelines**, including the area between the mean high water mark and 150 feet inland.
- **Lagoon and Reef,** including the area extending seaward from the mean high water mark (MHWM) to the outer slope of the fringing reef.
- **Wetlands and Mangroves**, including those areas which are permanently or periodically covered with water, and where species of wetland or mangrove vegetation can be found.
- **Port and Industrial,** including those areas surrounding the commercial ports of Saipan, Tinian and Rota.
- **Coastal Hazards**, including those areas identified as a coastal flood hazard zone by FEMA, or as amended through DCRM regulatory updates.

Given that the CNMI is composed of relatively small land masses, a large percentage of coastal land falls within one or more APCs. DCRM is currently in the process of updating some of its APC boundaries, as well as modifying associated regulations. As the Wetlands APC is re-delineated, shoreline setbacks are modified based on recent climate studies, and coastal hazard zones are re-assessed, it will be vital that all entities involved in the permitting process and coastal development have access to this updated information.

Within the Shoreline APC, DCRM anticipates the establishment of a variable setback regulation in which some properties require greater setback distances due to projected changes in shoreline movement and sea level. Similar variations may also be implemented in the Coastal Hazards zones in response to a recent CNMI climate vulnerability study. Given that these regulations have remained relatively unchanged over the past decade, this new variability is likely to produce some confusion, and will require a tool to help communicate or visualize distinctions among different properties.

CZMA Section 309 Strategy

In addition to consideration of APCs, DCRM would like to better integrate the results of work that has been conducted through its CZMA Section 309 strategy. In particular, recent work in the enhancement areas of Public Access and Coastal Hazards has produced new information that will be pertinent to permitting and development decisions.

Coastal Hazards: Section 309 projects within the Coastal Hazards enhancement area aim to prevent or reduce threats through either eliminating development or managing re-development in high-hazard areas. The results of multiple shoreline erosion studies over the past five years, as well as a recently completed climate change vulnerability assessment, have provided DCRM with detailed knowledge of potentially hazardous coastal property, even in areas that fall outside the currently designated Hazards APC. Through integration of this information in a decision support tool, DCRM can enhance overall awareness of dynamic shorelines, and better mitigate future hazards that overlap with proposed development.

Public Access: Section 309 projects within the Public Access enhancement area aim to increase opportunities for public access to the coast, taking into account both current and future needs. DCRM is currently completing an update to its Public Shoreline Access Guide, which identifies all coastal properties in CNMI that provide access to the shoreline, and details the amenities and significant natural features distinct to each location. In the face of large scale coastal development, DCRM foresees a need to incorporate this information with other data related to management priorities, and factor in potential obstructions to access, or increased tourism demand in close proximity to proposed development.

An Opportunity to Integrate DCRM's Work and Guide Coastal Development

Ideally decisions concerning coastal development in the CNMI would automatically involve balanced consideration of DCRM's APCs, Section 309 enhancement areas, and other social and ecological parameters that may influence the resiliency of the islands' communities. Unfortunately, CNMI regulatory staff expertise and capacity in each of these areas varies, and significant discrepancies in data access related to these topics exist. Due to these insufficiencies, development proposals and permit applications in the CNMI are sometimes analyzed in a disjointed fashion. Furthermore, data related to DCRM APCs and 309 enhancement areas, such as wetland boundaries or climate vulnerabilities, are not always easy to find with respect to different coastal properties, making the review process unnecessarily complex. There is a glaring need for mechanisms that allow for a cohesive assessment of shoreline property conditions, and subsequent flagging of potentially harmful or unwise developments.

Considering the looming growth and proposed developments on Saipan, it is imperative that DCRM have decision support tools that can objectively filter new permit applications and development proposals for important social, physical, and ecological criteria. Likewise, open access to information about the conditions of coastal properties would benefit developers, decision-makers, and property owners immensely, and provide a long-overdue means of avoiding confusion among stakeholders. A NOAA Fellow would provide invaluable capacity in the design and development of such a tool. In the process of tool development, the Fellow would also make great strides in centralizing and synthesizing the information that DCRM and the CNMI need to continue developing along principles of resiliency and sustainability.

GOALS AND OBJECTIVES

The Fellow will work with multiple partners and collaborators to (1) integrate the work of DCRM sections and partner agencies through data centralization, and (2) achieve resilient and sustainable growth in the CNMI through creation of decision support tools. To accomplish these goals, the following objectives will be met:

Objective 1 – Research the design of decision-making tools for coastal property owners and guidance for streamlining permitting processes, identifying any relevant literature and experiences of other agencies and jurisdictions.

Objective 2 – Work with DCRM and partner agencies to identify sources for all data pertaining to CNMI coastal properties, including boundaries, ownership, management, jurisdiction, and land use.

Objective 3 – Work with DCRM and partner agencies to identify all data pertaining to DCRM's APC boundaries, relevant Section 309 enhancement areas, and other environmental parameters relevant to coastal development.

Objective 4 – Lead efforts to standardize and integrate relevant data into a comprehensive database or other applicable information system.

Objective 5 – Develop a system of characterizing coastal properties as priority protection or conservation areas based on integrated data.

Objective 6 – Design and pilot a tool that allows users to access information about CNMI coastal properties, including the ability to make queries regarding priority development concerns.

MILESTONES AND OUTCOMES

Project milestones and outcomes are understood to be flexible as some project tasks, particularly those related to identifying and integrating data, are dependent on correspondence with partner agencies that often operate on "island time".

Timeframe	**Milestones and Outcomes**
August - November 2015	Fellow becomes familiar with CNMI regulatory processes, DCRM APCs, and data stewards from partner agencies.
November – December 2015	Fellow researches feasible designs for decision support tools and produces a detailed work plan to accomplish objectives.
January – May 2016	Fellow identifies and procures necessary datasets related to coastal properties and regulatory parameters.
June – August 2016	Fellow standardizes and integrates all data into a common database or information system.
July 2016	Fellow has observed and/or participated in DCRM's review of permits for any new developments proposed since the fellowship began.
August 2016 – October 2016	Fellow has developed a system for using data to identify and characterize priority coastal properties based on DCRM management and regulatory concerns.
February 2017	Fellow has created a tool that allows users to query conditions of CNMI coastal properties.
March 2017 – May 2017	Fellow pilots and evaluates decision support tool with DCRM permitting and partner regulatory agency staff.
July 2017	Fellow has submitted a detailed report on their product, evaluated its initial utility, and has a basic plan for tool updates and refinement.
August 2017 - …	Fellow utilizes their fellowship experience to accomplish great things in the world of coastal zone management!

PROJECT DESCRIPTION

While DCRM anticipates overlapping tasks, the Fellow's project can be understood in four phases: Research and conceptual design, Data integration, Tool creation, and Piloting.

Phase 1: Research and conceptual design (Objective 1; Objective 5)

A decision support tool that cuts across agency and stakeholder boundaries has never been piloted in the CNMI, and is a fairly novel concept in any jurisdiction. The Fellow will need to spend significant time assessing the needs of potential users, the applicability of available data, and the feasibility of tool designs. The assessment of agency and stakeholder needs will commence almost immediately as the Fellow begins work through initial observation and subsequent participation in proposed development reviews. In addition to participation in the permit application and review process, the Fellow may wish to conduct focus groups or workshops among agency partners and/or private organizations to identify what information will be most useful in guiding new coastal development, and what information or data is actually available. Extensive consultation with DCRM Permitting and Planning Sections will facilitate this, and these staff may assist in the facilitation of any needs assessment focus groups or workshops.

The Fellow will also conduct a concurrent review of existing decision support tools, including geospatial applications that are being used in other locations to guide land use planning. This suite of examples will feed into their eventual tool design. The Fellow will take stock of in-house technical capacity to determine the feasibility of possible tools.

As the fellowship progresses, the needs assessment and a comprehensive data inventory will be revisited with DCRM and partner agency staff to identify the specific attributes of coastal properties that make them critical to conservation efforts, future access, and/or hazard mitigation. The Fellow will work with DCRM's GIS Specialist, and potentially regional technical resources, including geospatial experts at NOAA's Pacific Services Center, to develop a means of automating the identification of critical or "priority" coastal properties based on available data. Ideally the Fellow will have some background in geospatial data management or analysis, making them familiar with various methods of analyzing multiple data sets. Additional capacity within DCRM and among partner agencies or regional contacts is available to assist with any stumbling blocks that may arise in this endeavor.

Phase 2: Data Collection and Integration (Objective 2; Objective 3; Objective 4)

The Fellow will also need to work with data stewards from partner agencies to inventory available boundary datasets and any other spatial data related to regulatory concerns or DCRM management priorities. Due to the scattered nature of data holdings in the CNMI, a scheme for standardization and integration will need to be devised. Collaboration with the CNMI GIS User Group will be necessary for this task; however, the DCRM GIS Specialist and Coastal Hazards Specialist will provide guidance in the data acquisition process.

DCRM anticipates that the Fellow will encounter issues with dataset documentation and quality control, and the Fellow will likely need to perform investigations with data providers to determine the best procedure for assuring the accuracy and temporal appropriateness of information. Parcel and property information, in particular, will require the Fellow to collaborate with the CNMI's Land Surveyor, Paul Camacho, and staff at the Department of Public Lands in order to make any necessary adjustments.

As data is collected and quality control measures are instituted, the Fellow will be accomplishing indirect tasks of data organization and centralization of agency information throughout the CNMI. This feat will generate interest locally and regionally in leveraging this new source of organized data, and the Fellow may wish to engage with regional information aggregation initiatives coordinated by the Pacific Islands Climate Change Cooperative (PICCC) and ESRI.

Phase 3: Tool Creation (Objective 5; Objective 6)

The Fellow's efforts to integrate information into a comprehensive database or information system should be compatible with whatever tool they intend to use to leverage that information. DCRM envisions a database-driven geospatial application that can be hosted online; however, the Fellow may decide that another form of tool is more useful, such as a step-by-step guide for considerations prior to development of coastal properties, or simply a large information portal. Regardless of tool design, the Fellow will include functionality for users to query specific coastal properties or parcels, highlighting the most significant regulatory concerns and management priorities in that area.

While the project milestones and outcomes list the creation of this tool as a specific component in the latter part of the fellowship, parts of this phase will actually commence in concert with Phase 1 during the development of a suite of example tools. The Fellow will be encouraged to begin exploring available tools and templates with DCRM technical staff at an early stage. The Fellow will also be encouraged to document the flow of decision-making involved in DCRM and partner agency reviews of development proposals, and to use this workflow as a guide in deciding upon a tool design.

During this phase DCRM will seek training and professional development opportunities that would provide valuable skills, and put the Fellow in contact with individuals from other jurisdictions that have developed, or are developing, decision support tools.

Phase 4: Piloting the Tool (Objective 6)

In their second year, the Fellow will coordinate with DCRM staff to conduct a pilot run or beta test of the tool. The tool will be utilized by agency staff, and potentially other stakeholders throughout the review process of a new development proposal. Over the course of several tests, the Fellow will focus on both documentation of the tool's usefulness and outreach to raise awareness among other CNMI agencies and regional partners about the tool.

DCRM Planning staff will assist the Fellow in developing a set of rudimentary metrics for evaluation of the tool. While the Fellow will be encouraged to provide DCRM with a report on the tool and a brief plan for tool enhancements or updates, DCRM also recognizes that the creation and testing of a product of this nature in the CNMI constitutes a success in and of itself.

The DCRM Director and Permitting staff will work with the Fellow in promoting the use of their project deliverables, which include both a tangible tool, and a newly organized source of CNMI-wide data. Opportunities for outreach will include meetings between government agencies and developers, one-on-one meetings with agency heads (facilitated by the DCRM Director), public media outlets, and periodic forums held for tourism operators and local resource managers.

FELLOW MENTORING

Supervision and Staff Teamwork

The Fellow will be housed at the Division of Coastal Resources Management in Saipan, and will be directly supervised by the Director of DCRM, Ms. Fran Castro. The Fellow will sit within the Planning Section at DCRM, interacting most closely with the Coastal Resource Planners, GIS Specialist, and Coastal Hazards Specialist. This team will provide the Fellow with the necessary background in recent DCRM projects that may be relevant to the Fellow's work, assist in the procurement of data, and offer opportunities to network with partner agencies. As the fellowship progresses, the Fellow may wish to sit with, or interact more closely with Permitting staff in order to test ideas and designs for their project deliverables.

DCRM Mentor

DCRM proposes a successful and reliable mentoring experience through the provision of a mentor within DCRM, as well as a co-mentor from the CNMI NOAA Field Office. DCRM's Coastal Hazards Specialist, Robbie Greene, will be the in-house mentor, providing day-to- day guidance for the Fellow. Having successfully transitioned from Sea Grant work on the U.S. Mainland to the CNMI's coastal zone program, Robbie is well-suited to facilitate the Fellow's adaptation to the Saipan working environment, and will be a valuable resource for the Fellow as they begin to work with partner agencies. Robbie will also assist in securing professional development opportunities for the Fellow, encouraging DCRM's support for relevant trainings, workshops, and conferences.

NOAA Mentor

The NOAA OCM Site Liaison, Dr. Dana Okano, will serve in a mentoring capacity by providing broader guidance to the Fellow, especially with regard to project components that may require collaboration with government agency heads, or leveraging of federal resources. Dr. Okano has experience providing support to past NOAA Coral and Coastal Fellows, and will be a dependable means of guidance throughout the project.

Other Opportunities

In addition to the development opportunities that NOAA and DCRM provide, the Fellow will benefit from their unique position in a small, evolving U.S. Territory. Their role as the project lead will place them in a position where they are able to transform the way in which the CNMI manages and utilizes government agency data, and the proposed project deliverables may have a significant influence on the future landscape and land use configuration of Saipan. Because of this prominent role, the Fellow will be a subject matter expert in the CNMI, and subsequently exposed to opportunities at the regional and federal level to share their work.

PROJECT PARTNERS

While the fellow will work most closely with DCRM's Planning and Permitting Sections, the project will involve extensive collaboration with other CNMI agencies and regional initiatives.

Local CNMI Agencies: The CNMI's Division of Environmental Quality (DEQ), Department of Lands and Natural Resources (DLNR), Historic Preservation Office (HPO), and Zoning Office coordinate frequently with DCRM on the review of proposals for new developments. The Fellow will work with staff from these agencies in procuring relevant data, as well as assessing the needs of CNMI stakeholders for a decision support tool. These agencies also have a vested interest in the organization and centralization of CNMI spatial data, and we anticipate their enthusiastic cooperation in leveraging any available technical resources to complete this project.

Community Organizations and Business Associations: There has been a long-running disconnect between the work of CNMI government agencies and the affairs of community organizations and business associations. The Fellow will have the opportunity to implement a pivotal change in this relationship through the design of a tool that can be used by multiple stakeholders. In light of this, DCRM will work to facilitate collaborative meetings with organizations such as the Hotels Association of the Northern Mariana Islands (HANMI), the Chamber of Commerce, and the Mariana Islands Visitors Authority.

Regional Partnerships: DCRM has recently entered into a collaboration with the Pacific Islands Climate Change Cooperative (PICCC) to contribute CNMI-specific data to a Pacific Islands "Conservation Planning Atlas". PICCC will be continuously incorporating new conservation-related information into this interactive atlas over the next several years, and has expressed interest in working with CNMI stakeholders to access any data that is being used to drive planning and decisions related to land use or environmental protection. The Fellow will have the opportunity to integrate their project with this broader effort.

COST SHARE DESCRIPTION

The required $15,000 non-federal fellowship match will be provided by DCRM, through local territory revenue. DCRM will work out the details of this agreement with OCM.

The Fellow will be provided with their own work station in the DCRM office, including a personal computer equipped with the Microsoft Office Suite, ArcGIS and related database management software, a CNMI government email address, all necessary office supplies, and associated computer equipment (e.g. flash drive, external hard drive, etc.). DCRM will conduct a preliminary needs assessment with the Fellow in order to secure any additional resources that might be useful for the Fellow's project. The Fellow will be provided administrative access to DCRM's website and ArcGIS Online account as the project progresses.

The Fellow will also have access to shared equipment including heavy-duty scanners, a fax machine, projectors, office printers and map plotter, GPS units, office laptops, office vehicles (including a boat), . The CRM office will provide for all secretarial and administrative support that is necessary for the Fellow to complete his/her work. Through the position with DCRM, the Fellow will have access to all local government offices, data, and trainings that may be provided.

STRATEGIC FOCUS AREA

The proposed fellowship directly addresses all three of OCM's priority areas. The Fellow's project will promote *Healthy Coastal Ecosystems* by developing a tool or geospatial application that will align the conservation priorities and interests of multiple partners and agencies. In developing this tool, the project will foster *Resilient Coastal Communities* by instilling risk-wise components through the integration of hazards data and considerations. While the project will assist the CNMI in achieving goals related to conservation and hazard mitigation, it is also designed to have a significant influence in promoting a *Vibrant and Sustainable Economy*. The Fellow will be uniquely positioned to apply data related to conservation and hazards in a manner that directly guides coastal development, and ultimately the economic growth of the CNMI.